

RioTinto

**Kennecott Eagle Minerals**

Jonathan C. Cherry, P.E.  
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February 6, 2009

Ms. Kate Lederle  
Michigan Department of Environmental Quality  
Land and Water Management Division  
Permit Consolidation Unit  
525 West Allegan Street  
P.O. Box 30204  
Lansing, MI 48909-7704

Dear Ms. Lederle:

**Re: File Number 08-52-0104-P, Humboldt Mill Joint Permit Application for an Inland Lakes and Streams Permit, Kennecott Eagle Minerals Company**

In a letter dated January 7, 2009 a request for clarification/information was received from the Land and Water Management Division (LWMD) titled "Application Correction Request." In fulfillment of your request, please find attached, answers to your questions, additional engineering detail and supporting documentation.

Should you have any questions please don't hesitate to contact me at 906-486-1257.

Sincerely,



Jon Cherry  
General Manager

cc: Hal Fitch, MDEQ  
Joe Derocha, Humboldt Township w/o attachment  
Steve Powers, Marquette County w/o attachment  
Gene Smary, Warner Norcross and Judd, LLC  
Jim Norine, M3, LLC  
Steve Donohue, Foth Infrastructure & Environment, LLC  
Vicky Peacey, Kennecott Eagle Minerals Company  
Alicia Duex, Kennecott Eagle Minerals Company

File: EC-Humboldt-ILSA-Corres to MDEQ

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**1. Provide the average dimensions of the entire fill proposed fill area in section 10A.**

KEMC Response: The application section 10A has been updated in the fields for fill dimension and this version has been attached for insertion into the permit application (Attachment A). The fill area is the basin where tailings will be placed and is irregular in every dimension. The 2,440 foot length of the fill area lies along Section A-A' on Figure 2-3. The width of 501 feet in Section 10A is an average width, representing the theoretical width of the total volume of tailings along the 2,440 foot length at a depth of 53 feet, which is an average depth evaluated along Section A-A'.

Figure 2-1 has been updated to include the surface area of the top of the tailings for each phase. Figures 2-3 and 2-4 now include a table with the following information regarding the proposed tailings fill for Sections A-A', B-B', C-C' and D-D':

- Elevation at the deepest point of the proposed tailings for each section,
- Elevation at the top of the tailings,
- Depth of tailings at the deepest location along each section,
- Width at the widest location along each section,

Updated Figures 2-3 and 2-4 are included in Attachment B for insertion into the permit application.

**2. Provide the pipe diameters and invert elevations in Section 10J**

KEMC Response: The Humboldt Mill Tailings Disposal Facility (HTDF) has four intake/outlet pipes:

- The waste water treatment plant (WWTP) influent pipe
- The waste water treatment plant (WWTP) effluent pipe
- Mill process water intake pipe
- Tailings discharge pipe

There was not enough space within section 10J to include the pipe diameters and elevations for all four intake and outlet pipes. This information has been included on Figures 1-3, 2-1 and 2-5 (Attachment C).

**3. Provide a legible black and white 8 ½ x 11 copy of Figure 1-3 for public notice purposes.**

KEMC Response: A black and white 8 ½ x 11 copy of the revised Figure 1-3 is included within Attachment C.

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**4. Figure 2-3 and 2-4 location maps appear to have the phases reversed. Please clarify.**

KEMC Response: *The insets for both figures had the labels for Phases 1 and 3 reversed. Those figures have been revised and copies of Figures 2-3 and 2-4 are contained within Attachment B.*

**5. On Figure 2-5 show the dimensions of the wall and berm.**

KEMC Response: *Dimensions for the cutoff wall and berm have been added to Figure 2-5. An updated version of Figure 2-5 is included in Attachment C.*

**6. Provide black and white cross sections of the cutoff wall / slurry wall and berm showing boundaries of adjacent wetland, width of work area, and structure dimensions. Include height, base and top widths of the berm. Indicate length of the proposed berm. Enclosed is a site plan for reference.**

KEMC Response: *Three new drawings have been attached which provide all the information requested in Question 6:*

- *Figure 2-5a Humboldt Tailings Disposal Facility Civil Cut Off Wall*
- *Figure 2-5b Humboldt Tailings Disposal Facility Civil Cut Off Wall Civil Sections 1*
- *Figure 2-5c Humboldt Tailings Disposal Facility Civil Cut Off Wall Civil Sections 2*

*Figure 2-5a shows the cutoff wall and berm details in detail, profile and plan view, Figure 2-5b provides information for Sections A-A' and B-B' and Figure 2-5c contains Sections C-C', D-D' and E-E'. Copies of all three new figures are contained in Attachment D.*

*Sections G-G' and F-F' are contained within Figure 2-6b (Attachment E) and are further described in the answer to question 8 below.*

**7. Provide a site specific profile and cross section of the stationary water intake structure showing**

- a. The waters edge
- b. Location, elevation and dimensions of the proposed structure
- c. Location and dimensions of proposed excavation/dredge and/or fill areas
- d. Location and dimensions of excavation/dredge spoil areas
- e. Existing and proposed grades
- f. And cross section scale

KEMC Response: *Updated drawings of Figure 2-6 have been created consistent with the sample drawing provided in your January 7, 2009 letter. Please replace the original Figure 2-6 with Figure 2-6a and Figure 2-6b showing the stationary water intake*

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*structure and the outlet discharge into the wetland. Figures 2-6a and 2-6b are contained within Attachment E.*

*Figure 2-6b shows the waters edge of the HTDF, location, elevation and dimensions of the intake structure, grades and a cross section scale. Items 7c and 7d are not applicable since dredging, excavation, spoils or fill are not currently planned.*

**8. Provide a site specific profile and cross section of the outlet discharge into the wetland showing**

- a. Wetland edge/boundaries**
- b. Location, dimensions and discharge elevation of the proposed structure**
- c. Location and dimensions of proposed excavation/dredge and/or fill areas**
- d. Location and dimensions of excavation/dredge spoil areas**
- e. Existing and proposed grades**
- f. And cross section scale**

KEMC Response: *Updated drawings of Figure 2-6 have been created consistent with the sample drawing provided in your January 7, 2009 letter. Please replace the original Figure 2-6 with Figure 2-6a and Figure 2-6b showing the stationary water intake structure and the outlet discharge into the wetland. Figures 2-6a and 2-6b are contained within Attachment E.*

*Figure 2-6a shows the wetland boundary/edge, location, dimensions and discharge elevation of the outlet structure, grades and a cross section scale. Items 8c and 8d are not applicable since dredging, excavation, spoils or fill are not currently planned.*

*Figure 2-6a also provides information for Section G-G' and F-F'.*

**9. An emergency spillway was not noted on the site plans. Indicate where water will be directed in an emergency or explain why an emergency spillway is not proposed.**

KEMC Response: *HTDF effluent will be treated at the WWTP and discharged per the requirements of an NPDES permit. In the unlikely event of an emergency, such as a WWTP shut down from physical or mechanical problems or an exceptional stormwater event, the HTDF has capacity to store up to approximately 600 days of displaced water from tailings loading and precipitation. With some grading at the north perimeter of the HTDF, a surface elevation for the cut-off wall at or above elevation 1,543 MSL will be established. By meeting that elevation, the HTDF exceeds the capacity required for a 24 hr, 100 yr storm event. A 24 hr, 100 yr storm event would require 1.2 ft of added storage capacity for the HTDF. Assuming a water elevation of 1,538.5 ft MSL, a 24 hr, 100 yr storm event would result in a peak water level of 1,539.7 ft MSL, less than the containment elevation of 1,543 ft MSL. This will provide adequate contingency to address and resolve any potential emergencies or WWTP discharge issues.*

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**KEMC ADDITIONAL INFORMATION**

- An updated version of Page 14 of the permit application as well as the Table of Contents has been included in Attachment F. The document contains minor updates due to changes in figure numbers and addition of new figures.

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## **ATTACHMENT A**

Updated Application Section 10A and 10J

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<b>10. PROJECTS IMPACTING WETLANDS OR FLOODPLAINS OR LOCATED ON AN INLAND, LAKE OR STREAM OR A GREAT LAKE</b>			
<ul style="list-style-type: none"><li>• Check boxes A through M that may be applicable to your project and provide all the requested information.</li><li>• If your project may affect wetlands, also complete Section 12. If your project may impact regulated floodplains, also complete Section 13.</li><li>• To calculate volume in cubic yards (cu yd), multiply the average length in feet (ft) times the average width (ft) times the average depth (ft) and divide by 27.</li><li>• Some projects on the Great Lakes require an application for conveyance prior to Joint Permit Application completeness.</li><li>• Provide a cross section and overall site plan showing existing lakes, streams, wetlands, and other water features; existing structures; and the location of all proposed structures, land change activities and soil erosion and sedimentation control measures. Review Appendix B and EZ Guides to prepare site-specific drawings.</li><li>• Provide tables for multiple impact areas or multiple activities and provide fill and excavation/dredge calculations.</li></ul>			
<b>Water Level Elevation</b> On a Great Lake use IGLD 85 <input type="checkbox"/> surveyed <input type="checkbox"/> converted from observed still water elevation. On inland waters, <input type="checkbox"/> NGVD 29 <input checked="" type="checkbox"/> NAVD 88 <input type="checkbox"/> other _____ Observed water elevation (ft) 1537.88 date of observation (M/D/Y) June 5, 2007			
<input checked="" type="checkbox"/> <b>A. PROJECTS REQUIRING FILL</b> (See All Sample Drawings) ➔ Attach both overall site plan and cross-section views to scale showing maximum and average fill dimensions. Figs. 1-3, 2-1, 2-3, and 2-4			
(Check all that apply) <input type="checkbox"/> floodplain fill <input type="checkbox"/> wetland fill <input type="checkbox"/> riprap <input type="checkbox"/> seawall, bulkhead, or revetment <input type="checkbox"/> bridge or culvert <input type="checkbox"/> boat launch <input type="checkbox"/> off-shore swim area <input type="checkbox"/> beach sanding <input type="checkbox"/> boatwell <input type="checkbox"/> crib dock <input checked="" type="checkbox"/> other inland lake fill			
Fill dimensions (ft) See Section 2.10 and Figures 2-1, 2-3 and 2-4 length 2440 ft width 601 ft ave maximum depth 75 ft max., 53 ft ave		Total fill volume (cu yd) 2.4 x E06 cy	Maximum water depth in fill area (ft) 190
Type of clean fill <input type="checkbox"/> pea stone <input type="checkbox"/> sand <input type="checkbox"/> gravel <input type="checkbox"/> wood chips <input checked="" type="checkbox"/> other tailings from ore beneficiation		Will filter fabric be used under proposed fill? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (If Yes, type) _____	
Source of clean fill <input type="checkbox"/> on-site ➔ If on-site, show location on site plan <input type="checkbox"/> commercial <input checked="" type="checkbox"/> other ➔ If other, attach description of location		See section 2.10 of this application	
Fill will extend _____ feet into the water from the shoreline and upland 0 feet out of the water.		Fill volume below OHWM (cu yd) 2.4 x E06 cy	
<input type="checkbox"/> <b>B. PROJECTS REQUIRING DREDGING OR EXCAVATION</b> (For dredging projects see Sample Drawing 7, for excavation see other applicable Sample Drawings) ➔ Attach both plan and cross-section views to scale showing maximum and average dredge and/or excavation dimensions, and dredge disposal location.			
(Check all that apply) <input type="checkbox"/> floodplain excavation <input type="checkbox"/> wetland dredge, excavation or draining <input type="checkbox"/> seawall, bulkhead, or revetment <input type="checkbox"/> navigation <input type="checkbox"/> boatwell <input type="checkbox"/> boat launch <input type="checkbox"/> other			
Total dredge/excavation volume (cu yd) _____		Dredge/excavation volume below OHWM (cu yd) _____	
Dimensions length width depth		Method and equipment for dredging	
Has proposed dredge material been tested for contaminants? <input type="checkbox"/> No <input type="checkbox"/> Yes		Dredged or excavated spoils will be placed <input type="checkbox"/> on-site <input type="checkbox"/> off-site ➔ Provide detailed disposal area site plan and location map. ➔ Provide Letter of authorization from owner, if disposing of spoils off site.	
➔ If Yes, provide Test Results with a map of sampling locations			
Has this same area previously been dredged? <input type="checkbox"/> No <input type="checkbox"/> Yes If Yes, date and permit number: _____			
If Yes, are you proposing to enlarge the previously dredged area? <input type="checkbox"/> No <input type="checkbox"/> Yes			
Is long-term maintenance dredging planned? <input type="checkbox"/> No <input type="checkbox"/> Yes If Yes, when and how much? _____			
<input checked="" type="checkbox"/> <b>C. PROJECTS REQUIRING RIPRAP</b> (See Sample Drawings 2, 3, 8, 12, 14, 17, 22, and 23. Others may apply)			
Riprap waterward of the <input type="checkbox"/> shoreline OR <input type="checkbox"/> ordinary high water mark		Dimensions (ft) length width depth	
Riprap landward of the <input checked="" type="checkbox"/> shoreline OR <input type="checkbox"/> ordinary high water mark		Dimensions (ft) length 10 width 25 depth 1.5	
Type of riprap <input type="checkbox"/> field stone <input checked="" type="checkbox"/> angular rock <input type="checkbox"/> other _____		Will filter fabric be used under proposed riprap? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, type geotextile fabric	
<input type="checkbox"/> <b>D. SHORE PROTECTION PROJECTS</b> (See Sample Drawings 2, 3, and 17) Complete Sections 10 A, B and/or C above, as applicable (check all that apply) <input type="checkbox"/> riprap/revetment - length (ft) _____ <input type="checkbox"/> seawall/bulkhead - length (ft) _____ <input type="checkbox"/> other - length (ft) _____ Distances of project from both property lines (ft) _____			
<input type="checkbox"/> <b>E. DOCK - PIER - MOORING PILINGS - ROOFS</b> (See Sample Drawing 10) Dock Type <input type="checkbox"/> open pile <input type="checkbox"/> filled <input type="checkbox"/> crib Seasonal support structure? <input type="checkbox"/> No <input type="checkbox"/> Yes Permanent Roof <input type="checkbox"/> No <input type="checkbox"/> Yes Mounted on _____ Maximum Dimensions: length width height Proposed structure dimensions (ft) length width Dimensions of nearest adjacent structures (ft) length width			
<input type="checkbox"/> <b>F. BOAT WELL</b> (See EZ Guides) Type of sidewall stabilization <input type="checkbox"/> wood <input type="checkbox"/> steel <input type="checkbox"/> concrete <input type="checkbox"/> vinyl <input type="checkbox"/> riprap <input type="checkbox"/> other _____ Boat well dimensions (ft) length width depth Number of boats _____ Volume of backfill behind sidewall stabilization (cu yd) _____ Distances of boat well from adjacent property lines (ft) _____			
<input type="checkbox"/> <b>G. BOAT LAUNCH</b> (See EZ Guide) (check all that apply) <input type="checkbox"/> new <input type="checkbox"/> existing <input type="checkbox"/> public <input type="checkbox"/> private <input type="checkbox"/> commercial <input type="checkbox"/> replacement Proposed overall boat launch dimensions (ft) length width depth Type of material <input type="checkbox"/> concrete <input type="checkbox"/> wood <input type="checkbox"/> stone <input type="checkbox"/> other _____ Existing overall boat launch dimensions (ft) length width depth Boat launch dimensions (ft) below ordinary high water mark Length width depth Distances of launch from both property lines (ft) _____ Number of adjacent Skid pier dimensions (ft) length width Skid pier dimensions (ft) length width			
<input type="checkbox"/> <b>H. BOAT HOIST</b> (See EZ Guide) (Check all that apply) <input type="checkbox"/> seasonal <input type="checkbox"/> permanent <input type="checkbox"/> cradle <input type="checkbox"/> side lifter <input type="checkbox"/> other _____ located on <input type="checkbox"/> seawall <input type="checkbox"/> dock <input type="checkbox"/> bottomlands			
<input type="checkbox"/> <b>I. BOARDWALKS AND DECKS IN WETLANDS - OR - FLOODPLAINS</b> (See Sample Drawings 5 and 6) Provide table if necessary			
Boardwalk <input type="checkbox"/> on pilings <input type="checkbox"/> on fill		Deck <input type="checkbox"/> on pilings <input type="checkbox"/> on fill	
Dimensions (ft) length width		Dimensions (ft) length width	

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<b>10 Continued - PROJECTS IMPACTING WETLANDS OR FLOODPLAINS OR LOCATED ON AN INLAND LAKE OR STREAM OR A GREAT LAKE</b>					
<b>J. INTAKE PIPES (See Sample Drawing 16) <input checked="" type="checkbox"/> OUTLET PIPES (See Sample Drawing 22) See Figures 2-5 and 2-6a and 2-6b</b>					
Type <input type="checkbox"/> headwall <input type="checkbox"/> end section <input type="checkbox"/> pipe		If outlet pipe, discharge is to <input checked="" type="checkbox"/> wetland <input type="checkbox"/> inland lake			
<input checked="" type="checkbox"/> other screened intake structure		<input type="checkbox"/> stream, drain, or river <input type="checkbox"/> Great Lake <input type="checkbox"/> other			
Dimensions of headwall NA		Number of pipes 4		Pipe diameters and invert elevation Sect 2.10, Figs 1-3, 2-1	
OR end section (ft) length width depth					
<b>K. MOORING AND NAVIGATION BUOYS (See EZ Guide for Sample Drawing)</b>					
* Provide an overall site plan showing the distances between each buoy, distances from the shore to each buoy, and depth of water at each buoy in feet.					
* Provide cross-section drawing(s) showing anchoring system(s) and dimensions.					
Number of buoys		Boat Lengths		Type of anchor system Purpose of buoy <input type="checkbox"/> mooring <input type="checkbox"/> navigation <input type="checkbox"/> swimming	
Dimensions of buoys (ft)		Do you own the property along the shoreline? <input type="checkbox"/> No <input type="checkbox"/> Yes			
Width height swing radius chain length		* Attach Authorization Letter from the property owner(s), if No above.			
<b>L. FENCES IN WETLANDS, STREAMS, OR FLOODPLAINS (See EZ Guide for Drawing)</b>					
* Provide an overall site plan showing the proposed fencing through wetlands, streams, or floodplains.					
* Provide drawing of fence profile showing the design, dimension, post spacing, board spacing, and distance from ground to bottom of fence.					
(check all that apply)		Total length (ft) of fence through		Fence height (ft) Fence type and material	
<input type="checkbox"/> wetlands <input type="checkbox"/> streams <input type="checkbox"/> floodplains		wetlands streams floodplains			
<b>M. OTHER - e.g., structure removal or construction, breakwater, aerator, fish shelter, and structural foundations in wetlands or floodplains. See Section 2.10</b>					
Structure Description: Subsurface cut-off wall on north end of HTDF		Dimensions: 1800 feet long, 40-50 feet deep			
<b>11 EXPANSION OF AN EXISTING OR CONSTRUCTION OF A NEW LAKE OR POND (See Sample Drawings 4 and 15)</b>					
Which best describes your proposed waterbody use (check all that apply)					
<input type="checkbox"/> wildlife <input type="checkbox"/> stormwater basin <input type="checkbox"/> recreation <input type="checkbox"/> wastewater basin <input type="checkbox"/> other					
Water source for lake/pond					
<input type="checkbox"/> groundwater <input type="checkbox"/> natural springs <input type="checkbox"/> Inland Lake or Stream <input type="checkbox"/> stormwater runoff <input type="checkbox"/> pump <input type="checkbox"/> sewage <input type="checkbox"/> other					
Location of the lake/basin/pond <input type="checkbox"/> floodplain <input type="checkbox"/> wetland <input type="checkbox"/> upland					
Maximum dimensions (ft):		Spoils will be placed <input type="checkbox"/> onsite <input type="checkbox"/> offsite outside of wetland and floodplain <input type="checkbox"/> other			
length width depth		* Provide a Detailed Disposal Area Site Plan with location map, address, and disposal dimensions.			
Maximum Area:		* Provide a Letter of Authorization from off site disposal site owner.			
<input type="checkbox"/> acres <input type="checkbox"/> sq ft		* Provide elevations and cross sections for outlets and/or emergency. Complete section 10J			
Will project involve construction of a dam, dike, outlet control structure or spillway? <input type="checkbox"/> No <input type="checkbox"/> Yes (If Yes, complete Section 17) Basin has overflow. See Section 2.11					
<b>12 ACTIVITIES THAT MAY IMPACT WETLANDS (See Sample Drawings 8 &amp; 9, and complete sections 10 A and 10 B for dredge or excavation as applicable)</b>					
• For information on the MDEQ's Wetland Identification Program (WIP) visit <a href="http://www.michigan.gov/deqwetlands">www.michigan.gov/deqwetlands</a> or call 517-373-1170.					
• Complete the wetland dredge and wetland fill dimension information below for each impacted wetland area. * Attach tables for multiple impact areas or activities					
• Label the impacted wetland areas on a site plan, drawn to scale or with dimensions. * Attach at least one cross-section for each wetland dredge and/or fill area.					
• If dredge/excavation material will be disposed of on site, show the location on site plan and include soil erosion and sedimentation control measures.					
(check all that apply) <input type="checkbox"/> fill (Section 10A) <input type="checkbox"/> dredge or excavation (Section 10B) <input type="checkbox"/> boardwalk or deck (Section 10I) <input type="checkbox"/> dewatering <input type="checkbox"/> fences (Section 10L)					
<input type="checkbox"/> bridges and culverts (Section 14) <input type="checkbox"/> draining surface water <input type="checkbox"/> stormwater discharge <input type="checkbox"/> restoration <input type="checkbox"/> other					
Wetland dredge/excavation dimensions		maximum length (ft) maximum width (ft)		Dredge/excavation area	
				<input type="checkbox"/> acres <input type="checkbox"/> sq ft	
Wetland fill dimensions		maximum length (ft) maximum width (ft)		Fill area	
				<input type="checkbox"/> acres <input type="checkbox"/> sq ft	
Total wetland dredge/excavation area		Total wetland dredge/excavation volume		Total wetland fill area	
<input type="checkbox"/> acres <input type="checkbox"/> sq ft		(cu yd)		<input type="checkbox"/> acres <input type="checkbox"/> sq ft	
Total wetland fill volume (cu yd)					
The proposed project will be serviced by:					
<input type="checkbox"/> public sewer <input type="checkbox"/> private septic system * Show system on plans					
If septic system, has an application for a permit been made to the County Health Department? <input type="checkbox"/> No <input type="checkbox"/> Yes					
If Yes, has permit been issued? <input type="checkbox"/> No <input type="checkbox"/> Yes * Provide copy					
Has a professional wetland delineation been conducted for this parcel? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes					
* Provide a copy of the delineation. App C * Supply data sheets. See Section 2.12					
Applicant purchased property <input type="checkbox"/> before OR <input checked="" type="checkbox"/> after October 1, 1980.					
Is there a recorded MDEQ easement on the property? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If Yes, provide the easement number					
Has the MDEQ conducted a wetland assessment for this parcel? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes * If Yes, provide a copy of assessment or WIP number.					
Describe the wetland impacts, the proposed use or development, and any alternatives considered.					
Water will be displaced from the HTDF due to tailings placement. The water supply to the wetland may increase. See Section 2.12 and Section 3					
Does the project impact more than 1/3 acre of wetland? <input type="checkbox"/> No <input type="checkbox"/> Yes NA					
* If yes, submit a Mitigation Plan that includes the type and amount of mitigation proposed. For more information on mitigation go to <a href="http://www.michigan.gov/deqwetlands">www.michigan.gov/deqwetlands</a>					
Describe how impacts to waters of the United States will be avoided and minimized.					
A WWTP will be used so that discharged water to Wetland EE will meet Michigan Water Quality Standards. WWTP discharge is permitted under a separate NPDES permit for the project.					
Describe how impact to waters of the United States will be compensated. OR Explain why compensatory mitigation should not be required for the proposed impacts.					
Proposed project does not require mitigation or compensation, since water quality in receiving wetland will be protected and since there is no filling of a wetland. See Section 2.12.					
Is any grading or mechanized land clearing proposed? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes					
* Show locations on submitted site plan. See Section 2.12					
Has any of the proposed grading or mechanized land clearing been completed? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes					
* Show labeled locations on site plan					

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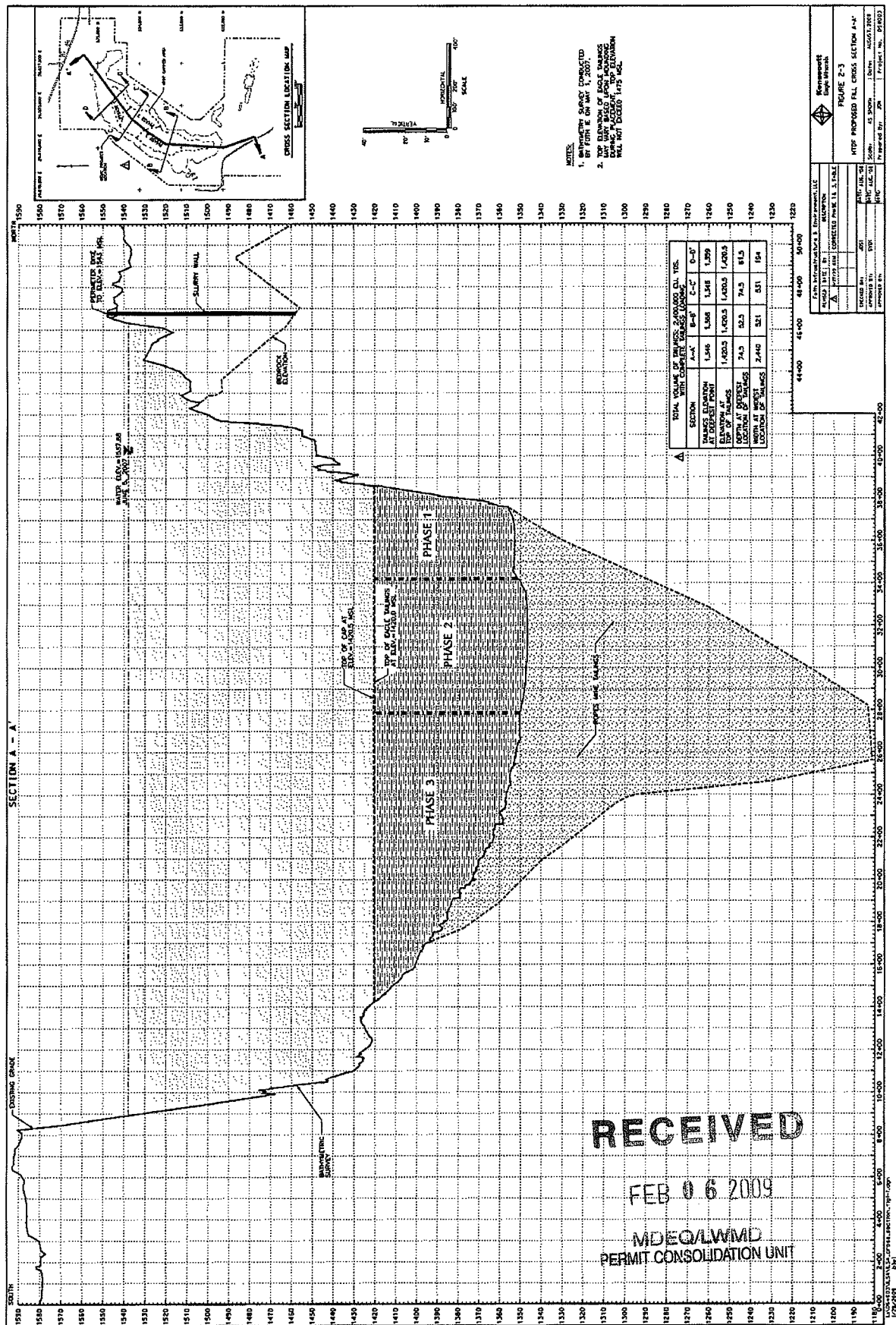
## **ATTACHMENT B**

Updated Figures 2-3 and 2-4

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## **ATTACHMENT C**

Updated Figures 1-3, 2-1 and 2-5

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REVISED	DATE	BY	DESCRIPTION
1	1/27/08	AKM	ADDED TABLES, REVISED WALL
2	1/27/08	AKM	ADDED TABLES, REVISED WALL
3	1/27/08	AKM	ADDED TABLES, REVISED WALL
4	1/27/08	AKM	ADDED TABLES, REVISED WALL
5	1/27/08	AKM	ADDED TABLES, REVISED WALL
6	1/27/08	AKM	ADDED TABLES, REVISED WALL
7	1/27/08	AKM	ADDED TABLES, REVISED WALL
8	1/27/08	AKM	ADDED TABLES, REVISED WALL
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34	1/27/08	AKM	ADDED TABLES, REVISED WALL
35	1/27/08	AKM	ADDED TABLES, REVISED WALL
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LOCATION	PIPE SIZE (IN)	ELEVATION (FT MSL) AT INLET/OUTLET
WMP INFLUENT	8	1550
WMP EFFLUENT	8	1535.33
WMP PROCESS WATER INFLUENT	4	~1400
TALINGS DISCHARGE	4/8 (SEE NOTE 7)	VALUES AT DEPTH
		SEE NOTE 8

LOCATION	PIPE SIZE (IN)	ELEVATION (FT MSL) AT INLET/OUTLET
WMP INFLUENT	8	1550
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		SEE NOTE 8





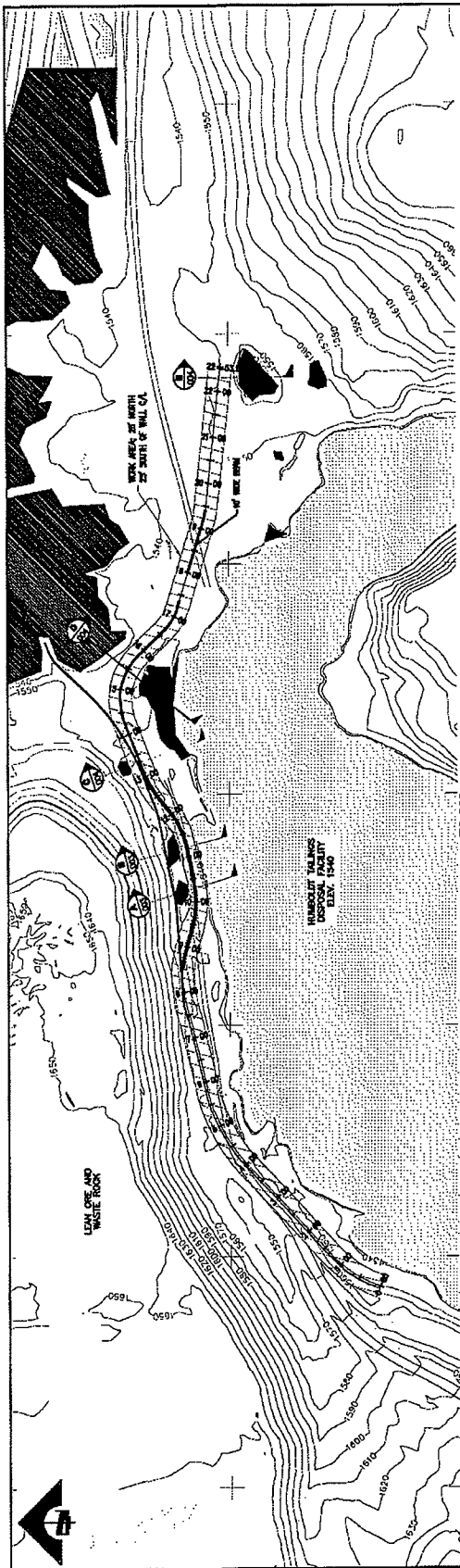
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## ATTACHMENT D

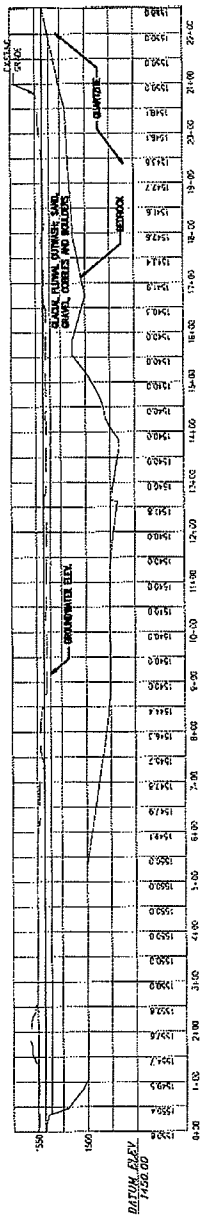
New Cut Off Wall Figures 2-5a, 2-5b and 2-5c

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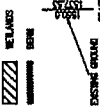
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ALUMINUM WALL = 11,000 SQ. FT.  
ALUMINUM WALL = 11,000 SQ. FT.

REVISIONS

1. TOPOGRAPHIC AND PLUMBING DATA SUPPLIED BY GEO-METRIC ENGINEERING, INDIANAPOLIS, INDIANA. DATE OF PHOTOGRAPHY: APRIL 27, 2008.
2. CONTOUR INTERVAL BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988. HORIZONTAL PLUMBING BASED ON NAD 83. HORIZONTAL CONTOURS BASED ON HORIZONTAL DATUM OF 1988.
3. ROAD PROJECT LOCATION WITH SECTIONS 2 & 11 1/2N, RANGE 14E, HANCOCK TOWNSHIP, MARSHALL COUNTY, INDIANA.
4. WELLS AND REMEDIATION BY USGS & MICHIGAN ENVIRONMENTAL INC. 2007. INDIANAPOLIS, INDIANA. PLANT COMPLETION, RELEASE AND WELLS EVALUATION APRIL 3, 2007.
5. GROUND WATER CONTOURS BY JOHN INFRASTRUCTURE AND ENGINEERING, APRIL 2007.
6. REMEDIATION CONTOURS BASED AFTER SUPPLY (1988)

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**KENNECOTT EAGLE MINERALS**  
FACILITY 2-M HANCOCK TOWNSHIP  
TALMADGE DISPOSAL FACILITY  
CUT OFF WALL

**M3 Engineering & Construction**  
14000 N. 14th Ave., Suite 200  
Indianapolis, IN 46240  
Tel: (317) 592-1100  
Fax: (317) 592-1101  
www.m3eng.com

**PRELIMINARY**  
NOT FOR CONSTRUCTION

DATE: 04/27/08  
DRAWN BY: MM  
CHECKED BY: MM  
APPROVED BY: MM  
CUT OFF WALL





**WOLFGANG PETERSON**  
**ALVIN KARPIS**

**◆ KENNECOTT EAGLE MINERALS**  
**FIGURE 2-3: HUMBOLDT**  
**TAILINGS DISPOSAL FACILITY**  
**CIVIL**  
**CIVIL SECTIONS 2**

**M3 Engineering & Technology Corp.**  
Tucson, Arizona [www.m3eng.com](http://www.m3eng.com)  
Tel: (520) 733-1488 Email: [info@m3eng.com](mailto:info@m3eng.com)  
Chandler, Arizona  
Tel: (480) 773-3907 Email: [info@chandler.m3eng.com](mailto:info@chandler.m3eng.com)  
Hermosillo, Sonora Mexico  
Tel: (52) 662-281-0255 Email: [info@hermosillo.m3eng.com](mailto:info@hermosillo.m3eng.com)

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## ATTACHMENT E

Updated/New Figure 2-6a and Figure 2-6b

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1. TOPOGRAHY AND PLANNING DATA SUPPLIED BY ARMO-RENTING ENGINEERING, DEERFIELD BEACH, FLORIDA.
2. DATE OF PHOTOGRAPHY: APRIL 27, 1969.
3. COASTLINE MEASUREMENTS BY NORTH AMERICAN WATERWAY OF 1968. HORIZONTAL DATUM BASED ON TWO SURVEY POINTS. COORDINATES BASED ON MECHANICAL SETTING PLANE.
4. TIDE GAUGE LOCATION WITHIN SECTIONS 2 & 11 TOWN, MARSHPORT TOWNSHIP, MARSHPORT COUNTY, MINNESOTA.
5. MEALD REVEALATION BY GORD & HODGSON ENGINEERS, INC. 2002. BIOLOGICAL SURVEY: PLANT COMMUNITIES, WILDLIFE AND WETLAND EVALUATION APRIL 5, 2007.
6. GROUND WATER CONTIGUES OF FORTH INFRASTRUCTURE AND ENVIRONMENT, JUNE 2007.
7. REMOTE CONTROL IMAGES ACQUIRED AFTER SETBACK, APRIL 1969

- NOTE**



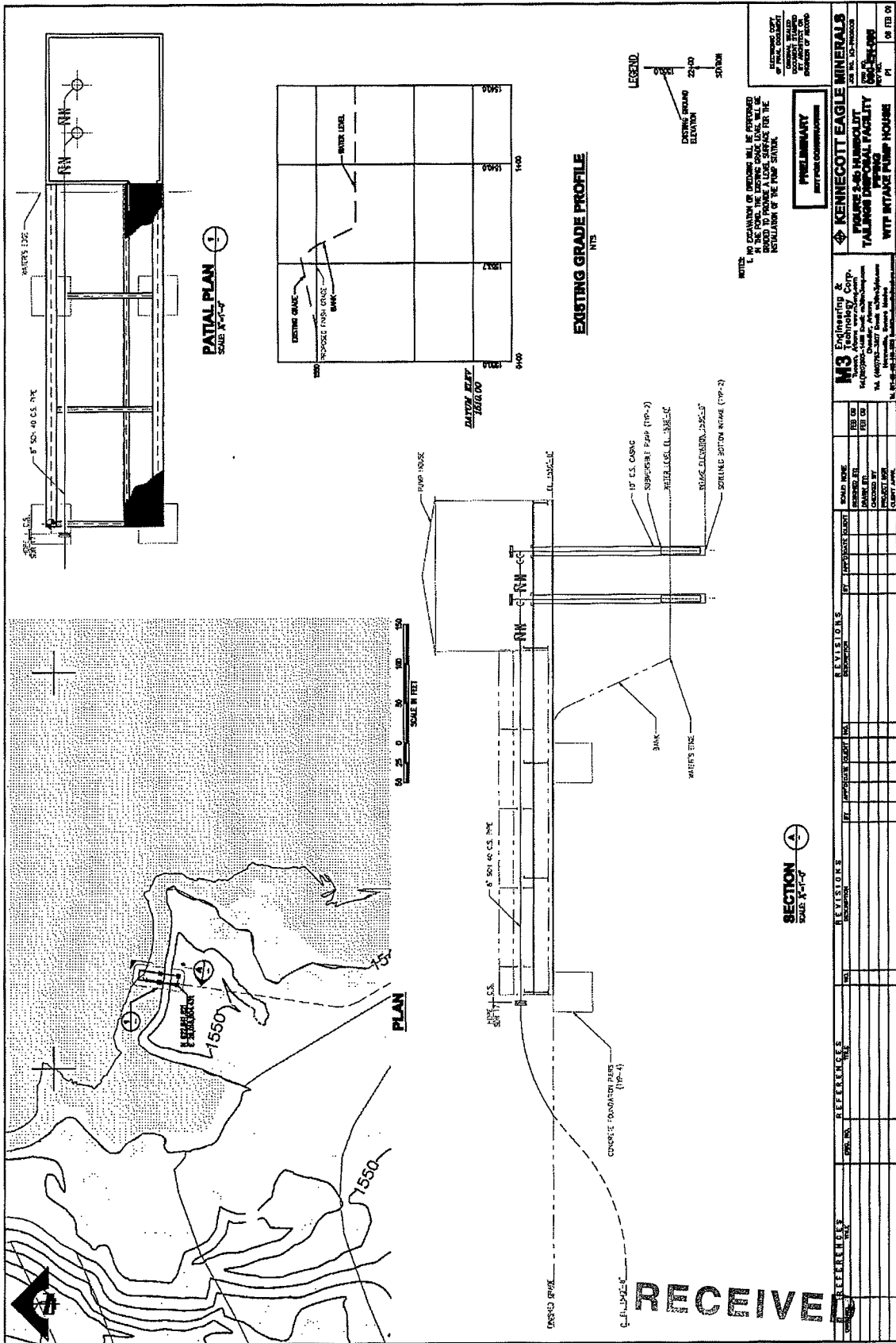
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## **ATTACHMENT F**

Update of Page 14 of the Joint Permit Application for Inland Lakes and Streams

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### *C. Riprap*

As a result of the tailings loading, approximately 13,500 ft<sup>3</sup> of water per day will be displaced from the HTDF during operations. Displaced water and water run-off from the HTDF will be treated at the WWTP if necessary, before discharging to a wetland north of the HTDF. The discharge area into the wetland will be lined with 12-in riprap (Figure 2-6). The riprap area will be approximately 10 ft wide by 25 ft long by 18-in deep, and will be underlain with geotextile fabric.

### *J. Intake / Outlet Pipes*

A screened intake structure will be installed in the HTDF for providing mill process water. The intake structure will be installed at the location shown in Figure 2-1.

Tailings will be placed at the bottom of the HTDF via a pipeline connected to a diffuser at the discharge outlet (Figure 2-2). The tailings slurry will be subaqueously placed at the HTDF bottom with the use of a floating barge having a discharge boom that can be positioned vertically across the floor. The barge will move in such a manner that the tailings will be uniformly distributed on the HTDF bottom.

A screened intake pipe for the WWTP will be installed in the HTDF at the location shown in Figure 2-1. A discharge pipe from the WWTP will be located in the wetland area as shown in Figure 2-5. Details for the WWTP intake and discharge pipes are shown in Figures 2-6a and 2-6b.

### *M. Other*

A low permeability cut-off wall will be constructed at the north end of the HTDF to prevent HTDF water from mixing with groundwater present in the alluvial soil at the location shown on Figure 1-3. The cut-off wall may extend up to 2,231 linear feet and will be keyed to the bedrock outcrop near elevation 1,543 ft. KEMC is considering different cut-off wall construction techniques, including cut/fill methods and vibratory beam injection methods. Both of these methods have been successfully used in similar type conditions. As shown in Figures 2-1 and 2-5, some grading will be needed at the north perimeter of the HTDF to establish a surface elevation at or above elevation 1,543 ft. By meeting that elevation, the HTDF exceeds the capacity required for a 24 hr, 100-yr storm event. Details appear in Figures 2-5a, 2-5b, and 2-5c.

## **2.11 Expansion of an Existing or Construction of a New Lake or Pond**

This section does not apply to the HTDF.

## **2.12 Activities That May Impact Wetlands**

Water displaced from tailings placement in the HTDF will be treated at the WWTP if necessary, before discharging to a wetland (Wetland EE) north of the HTDF. Approximately 13,500 ft<sup>3</sup> of water per day will be displaced from the HTDF during operations. Over the seven to eight year operating period approximately 175,000,000 to 200,000,000 ft<sup>3</sup> of water will be released from the HTDF including water displaced from tailings placement and released from natural precipitation events.

A wetland assessment has been completed for the area north of the HTDF. Wetland EE was investigated in a survey performed by King & MacGregor Environmental, Inc. (KME) in 2007. The survey is documented in Appendix C-1. Wetlands 1 through 8 were delineated by KME in

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3.1.2 HTDF Wetlands .....	19
3.1.3 Aquatic Biology .....	20
3.2 Environmental Impact Assessment .....	20
4. References .....	22

### Tables

(Tables located after Tables tab)

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-----------	--

### Figures

(Figures located after Figures tab)

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Figure 1-2	Property Ownership and Existing Conditions
Figure 1-3	Site Development Plan
Figure 1-4	Regional Setting and Watershed Boundaries
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Figure 2-2	Slurry Pipeline Design Features
Figure 2-3	HTDF Proposed Fill Cross Section A – A'
Figure 2-4	HTDF Proposed Fill Cross Sections B – B', C-C' and D – D'
Figure 2-5a	Humboldt Tailings Disposal Facility Civil Cut-Off Wall
Figure 2-5b	Humboldt Tailings Disposal Facility Civil Civil Sections 1
Figure 2-5c	Humboldt Tailings Disposal Facility Civil Civil Sections 2
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Figure 2-6b	Humboldt Tailings Disposal Facility Piping Pump House
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Figure 3-2	Bedrock Contour Elevations
Figure 3-3	Cross Section S-S'
Figure 3-4	Cross Sections T-T', U-U' and V-V'
Figure 3-5	Cross Sections W-W' and X-X'
Figure 3-6	HTDF Bathymetry
Figure 3-7	Historical Ariel Photos
Figure 3-8	Groundwater Elevation Contour Map – June, 2007

### Appendices

Appendix A	Joint Permit Application
Appendix B	Hydrologic and Geochemical Mass Balance Modeling Report
Appendix C	HTDF Biological Studies
	C-1 Humboldt Mill Project, Wetland Evaluation – Black River Wetland and Wetland EE
	C-2 Humboldt Mill Project, Wetland Delineation Wetlands 1-8
	C-3 Humboldt Mill Project Aquatic Survey of Wetland EE Complex
	C-4 Humboldt Tailings Disposal Facility Aquatic Survey Report
	C-5 Humboldt Project – HTDF Summary of 2007 Fish Metals Data
Appendix D	Letters of Authorization from Property Owners
Appendix E	Fill Calculations
Appendix F	Technical Memorandum: Impact of Increased Drainage through Wetland EE

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**Kennecott Eagle Minerals Company**

Entry Number	Date Revision Issued	Page(s)	Document/Section Number	Description
1	Feb. 6, 2009	3, 4 of 7	Appendix A Joint Permit Application	Revised 10A Fill dimensions. Revised 10J pipe diameters and invert elevations information.
2	Feb. 6, 2009	Figs. 1-3, 2-1, 2-3, 2-4	Figures	Updated piping information, fill information.
3	Feb. 6, 2009	Fig. 2-5	Figures	Updated cut-off wall, berm information.
4	Feb. 6, 2009	Figs 2-5a thru 2-5c	Figures	Address details of cut-off wall and berm.
5	Feb. 6, 2009	Fig 2-6	Figures	Deleted
6	Feb. 6, 2009	Figs 2-6a, thru 2-6b	Figures	Address details of mill process water intake structure.
7	Feb. 6, 2009	p. 14, TOC, report	Report	Updated figure references.

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